

# Two New *Argulus* Species (Branchiura: Argulidae) Found on Australian Bream (*Acanthopagrus* spp.)

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## ABSTRACT

Two species are described: *Argulus australiensis*, new species from *Acanthopagrus berda* (Forsk.) and *Argulus diversicolor*, new species from *Acanthopagrus latus*. (Houttuyn).

## INTRODUCTION

From May, 1982 to January, 1983, I collected and examined approximately 1,000 *Acanthopagrus* specimens, i.e. *A. berda*, *A. latus*, *A. butcheri* and *A. australis* from around Australia in order to assess the ectoparasite fauna of the economically important bream.

*Argulus* species found in this study are the first records from Australian marine waters. *Argulus macropterus* Heegaard (1962) on a *Mugil* sp. from the Murray River and the cosmopolitan *A. japonicus* Thiele (1900) from *Carassius auratus* at a Sydney freshwater aquarium are the only other members of this genus recorded in Australia.

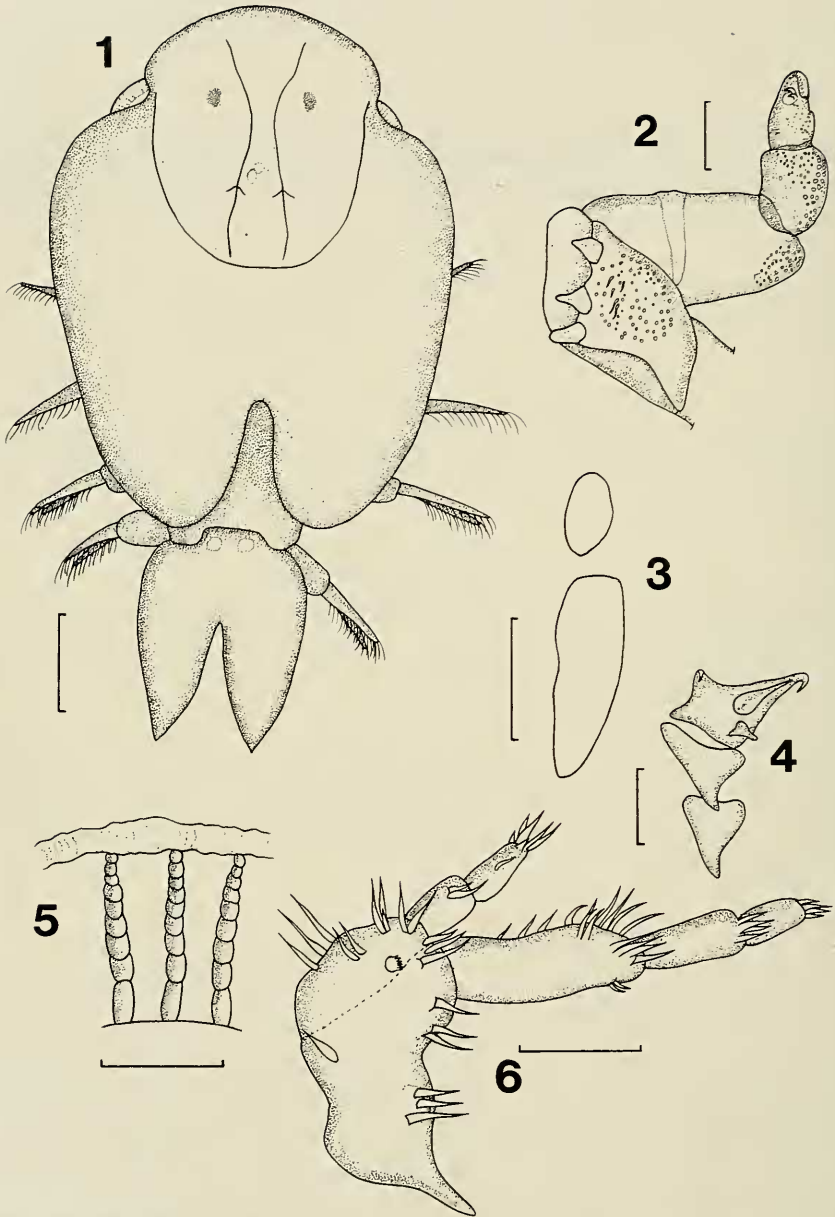
## MATERIAL AND METHODS

Samples of at least 40 fish per species, per site were collected at 23 localities from around Australia (all states).

Immediately after capture, fish were killed by pithing, their ventral body wall slit open, and they were dropped into 10% formalin. The body surface, fins, head, nares, mucous cavities, pseudobranchs, individual gill filaments and gill arches of each fish were examined under a dissecting microscope. The sediment resulting from dissection and that left in the drum containing the preserved fish were also examined.

Specimens were taken from 10% formalin and washed in distilled water before being stored in 70% ethanol. All parasites were cleared, dissected and examined in lactic acid. Standard cavity slides were used to hold specimens being measured in order to reduce compression by the coverslip.

Parasites were measured with a calibrated ocular micrometer. Measurements are given in micrometers. All drawings were made with the aid of a camera lucida.



*Argulus australiensis*, sp. nov.

Fig. 1. Female, dorsal. Fig. 2. Maxilliped, ventral. Fig. 3. Respiratory areas, ventral.

Fig. 4. First antenna, ventral. Fig. 5. Ribs of sucker. Fig. 6. Second antenna, ventral.

Scale lines: (1) 980 μm. (2) and (4) 250 μm. (3) 1,000 μm. (5) and (6) 100 μm.

NEW AUSTRALIAN ARGULIDS

SUBCLASS Branchiura

ORDER Argulidea

FAMILY Argulidae Leach

GENUS *Argulus* Müller

*Argulus australiensis*, sp. nov.

MATERIAL

One male and one female specimen collected. Female holotype and male allotype, deposited in Australian Museum (P35479 and P35480).

SITE

Unknown, specimens were found in debris of fish sample.

HOST

*A. berda*.

LOCALITY

Karumba, Queensland.

DESCRIPTION

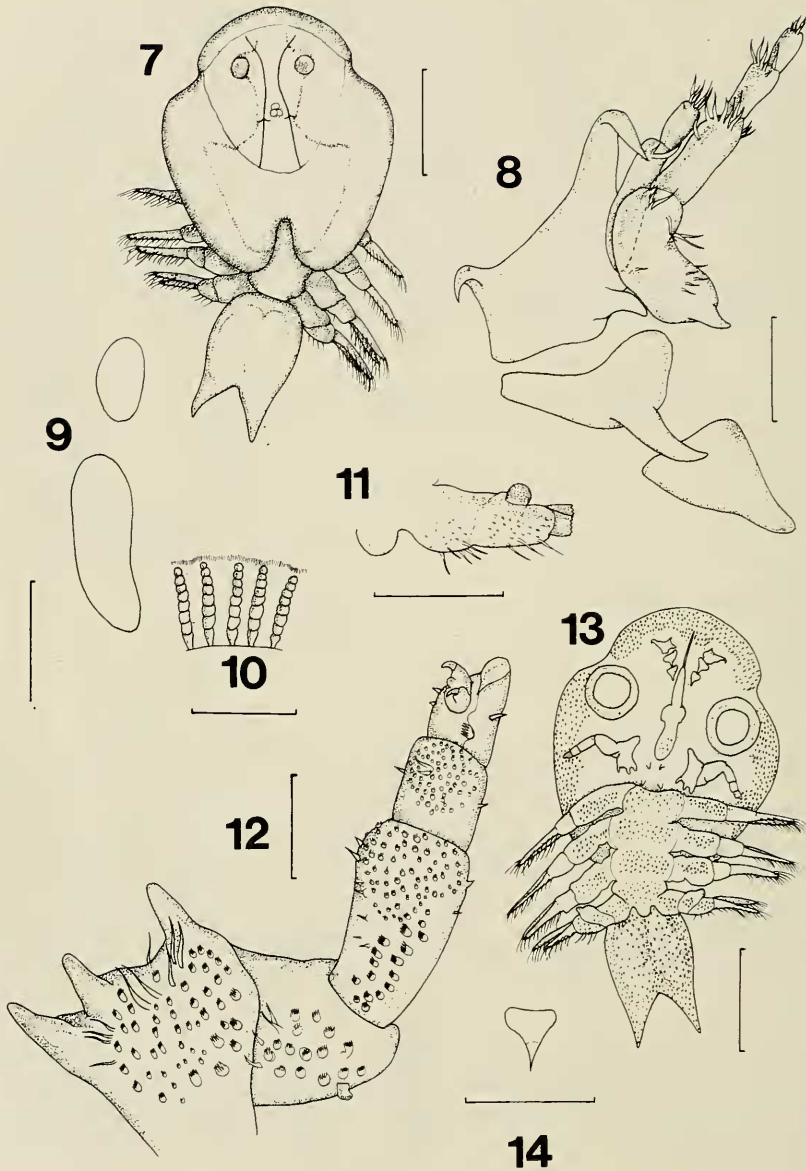
Female (Figs 1-6).

Measurements based on one specimen. Preserved specimen greenish-yellow in colour. Total length 7,350. Carapace elliptical, 5,150 x 4,018 (Fig. 1). Transverse groove arched upwards. Dorsal submedian ridges converge most closely between the large eyes then gradually diverge towards anterior and posterior ends. Lateral lobes rounded, posterior corners extending to bases of fourth pair of legs. Median posterior sinus deep, leaving portion of free thoracic region exposed.

Abdomen bilobed, longer than broad, 2,200 x 1,670, more than one quarter total length. Anal laminae small, barely projecting through bases of anal slits.

Respiratory areas (Fig. 3) of unequal size, much smaller anterior area. First antenna (Fig. 4) with stout basal spine which covers portion of postantennal spine; lateral hook reinforced by curved accessory spine; flagellum (Fig. 4) two-segmented and setose. Second antenna (Fig. 6) four-segmented; proximal segment armed posteriorly with a strong spine and a number of setae, distal segment with four apical setae.

Suckers large, 1,120 in diameter, ribs consisting of nine disks (Fig. 5). Maxilliped (Fig. 2) five-segmented; basal segment with three large, flat spines, one terminal and two subterminal spines. Chitinous plates on maxilliped with comb-like projections.



*Argulus australiensis*, sp. nov.

Fig. 7. Male, dorsal. Fig. 8. First and second antennae, ventral. Fig. 9. Respiratory areas, ventral. Fig. 10. Ribs of sucker. Fig. 11. Basal portion of fourth leg, ventral. Fig. 12. Maxilliped, ventral. Fig. 13. Male, ventral. Fig. 14. Tooth-like process.

Scales lines: (7) and (13) 1,000  $\mu\text{m}$ . (8), (10) and (12) 100  $\mu\text{m}$ . (9) and (11) 500  $\mu\text{m}$ . (14) 50  $\mu\text{m}$ .

## NEW AUSTRALIAN ARGULIDS

Swimming legs biramous, all project beyond lateral margins of carapace. Fourth leg with small lobe and a number of setae on posterior margin of basal segment.

Anterior and lateral margins of carapace, basal segments of swimming legs and abdomen covered ventrally with small, tooth-like spines.

Mouth tube about twice as long as wide and with ornamentation at base.

### Male (Figs 7-14).

Measurements based on one specimen. Preserved specimen pale yellow with two distinct bands of brown pigment (Fig. 7). Total length 4,160. Carapace 2,530 x 2,140, similar in shape to that of female although not reaching as far posteriorly.

Abdomen 1,330 x 820 bilobed but lobes not separated as much as in female. Spermatheca (Fig. 7) about three-quarter length of abdomen.

Respiratory areas (Fig. 9) similar to that of female. First antenna (Fig. 8) without accessory spine. Second antenna (Fig. 8) similar to that of female.

Suckers large (Fig. 13) 550 in diameter, ribs consisting of eight disks (Fig. 10). Maxilliped (Fig. 12) as in female except for an increased number of setules.

Swimming legs biramous, extending further from margins of carapace than in female. Basal portion of fourth leg modified as shown (Fig. 11).

Portions of ventral surface covered by tooth-like spines (Figs 13, 14).

### ETYMOLOGY

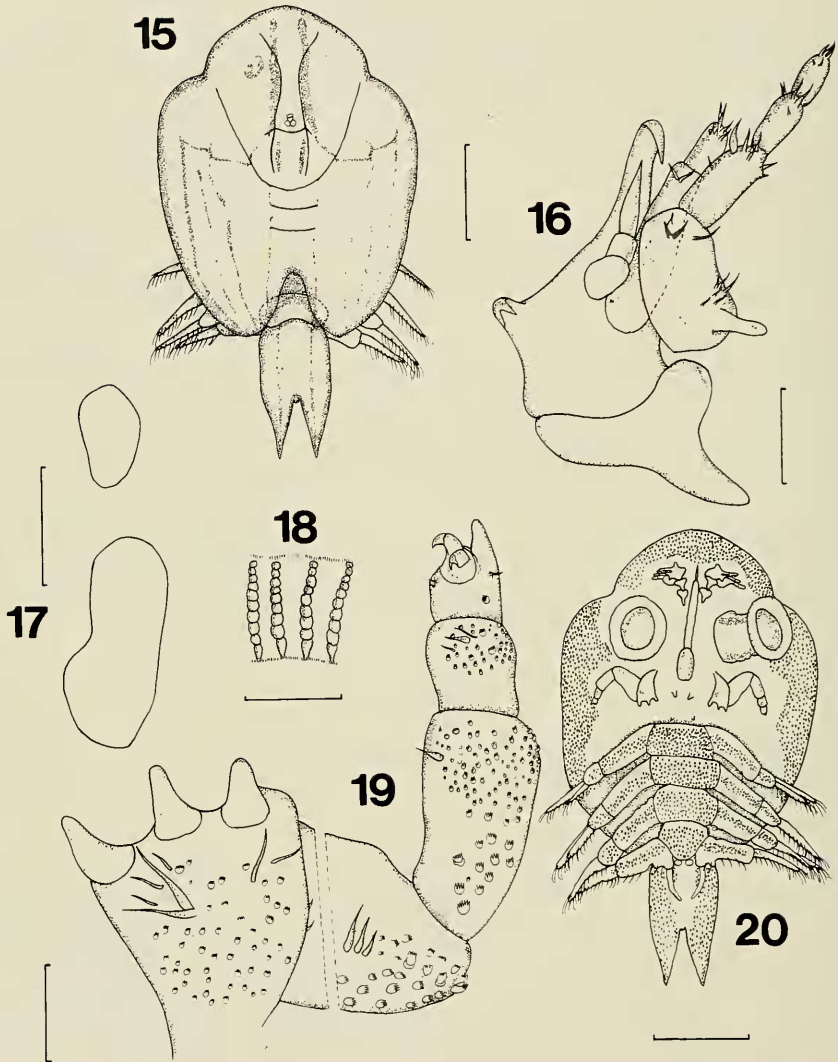
The name *australiensis* refers to the fact that this is the first marine argulid to be described from Australian waters.

### DISCUSSION

The present species is most similar to *Argulus diversicolor* described below. However, the new species lacks distinctive streaks on its dorsal surface, is larger, has a more rounded and robust abdomen, and has only nine disks in its sucker ribs compared with ten in *A. diversicolor*. The male is most similar in general character to *A. alexandrensis* Wilson (1923) from *Zeus* sp. in South Africa but can be easily distinguished from it by the shape of its carapace which is not as evenly elliptical and by its transverse groove which does not extend as far anteriorly as in *A. alexandrensis*.

### DIFFERENTIAL DIAGNOSIS

The female is distinguished by the shape of the carapace and respiratory areas as well as the armature of the antennae.



*Argulus diversicolor*, sp. nov.

Fig. 15. Female, dorsal. Fig. 16. First and second antennae, ventral. Fig. 17. Respiratory areas, ventral. Fig. 18. Ribs of sucker. Fig. 19. Maxilliped, ventral. Fig. 20. Female, ventral.

Scale lines: (15) and (20) 1,000  $\mu$ m. (16) (18) and (19) 100  $\mu$ m. (17) 500  $\mu$ m.

## NEW AUSTRALIAN ARGULIDS

The male differs from other species in the combination of the shape of the carapace, armature of the antennae and the number of the dorsal ribs.

### *Argulus diversicolor*, sp. nov.

#### MATERIAL

One female collected. Female holotype from *A. latus* at Point Samson, deposited in Australian Museum (P35481).

#### SITE

Gill filaments.

#### HOST

*A. latus*

#### LOCALITY

Carnarvon, Western Australia.

#### DESCRIPTION

##### Female (Figs 15-20).

Measurements based on one specimen. Preserved specimen smokey brown with a series of longitudinal deep brown bands running along carapace and abdomen (Fig. 15). Total length 4,800. Carapace elliptical, 3,510 x 2,740. Transverse groove arched upwards. Dorsal submedian ridges closest together between the large eyes, gradually diverging anteriorly and posteriorly. Lateral lobes rounded; posterior corners extending to, and nearly covering bases of fourth pair of legs. Median posterior sinus extending to base of second pair of swimming legs, with portion of free thoracic region exposed.

Abdomen bilobed, longer than wide, 1,410 x 780, more than one quarter total length. Anal laminae small, just visible projecting through bases of anal slits.

Respiratory areas (Fig. 17) of unequal size, much smaller anterior area. First antenna (Fig. 16) with stout basal spine which covers basal portion of postantennal spine; lateral hook bearing an accessory spine; flagellum two-segmented and setose. Second antenna (Fig. 16) four-segmented; proximal segment armed posteriorly with a strong spine and ten setae; distal segment with five setae (three terminal and two subterminal).

Suckers large (Fig. 20) 650 in diameter; ribs consisting of nine to ten disks, basal element longest (Fig. 18). Maxilliped (Fig. 19) five-segmented; basal segment with three large spines; terminal segment with an outer blade-like spine

and two inner sharply curved spines as well as a single comb-like process; all segments armed with setules and comb-like processes.

Swimming legs biramous, all project beyond lateral margins of carapace. Anterior and lateral margins of carapace, basal segments of swimming legs and abdomen covered ventrally with many tooth-like spines (Fig. 20). Mouth tube larger than wide, ornamentation at base.

No male found.

#### ETYMOLOGY

The name *diversicolor* refers to the characteristic longitudinal bands of pigment on the dorsal surface.

#### DISCUSSION

The present species is most similar to *A. matuii* Sikama (1938) collected in Japanese waters from *Parapristipoma trilineatum* (Thunberg). Both species have characteristic highly pigmented streaks or bands on their dorsal surfaces. However, *A. diversicolor* is most readily separated from *A. matuii* by the following characters: the presence of an accessory spine on the lateral hook of the first antenna, *A. matuii* has none; the number of crescentic disks of the suckers, *A. diversicolor* has nine to ten, *A. matuii* has fourteen to fifteen; more elongate shape of the respiratory area of the new species, and size of body proper, *A. diversicolor* is only about half the length of *A. matuii*.

#### DIFFERENTIAL DIAGNOSIS

The female differs from other species in the combination of the following: pigment bands on the dorsal surface, armature of the first antenna and the number of disks on the sucker ribs.

#### ACKNOWLEDGEMENTS

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